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Living Lightly

Occupations
Attract

Choosing
Survival

Willing and Able

UMaine Today

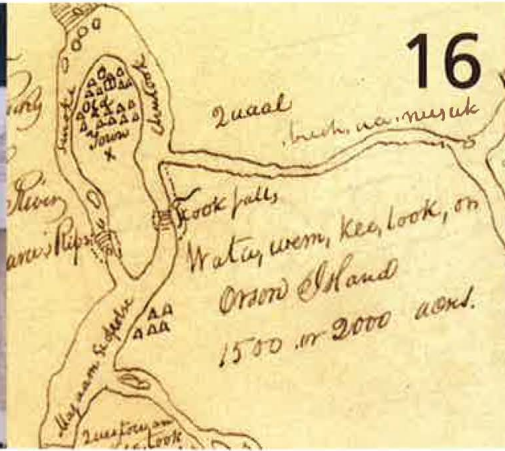
CREATIVITY AND ACHIEVEMENT AT THE UNIVERSITY OF MAINE

SPRING 2011

A stylized illustration of various birds in flight against a dark background. The birds are depicted in various colors including red, green, purple, blue, and brown. They are shown in different stages of flight, with wings spread, creating a sense of movement. The background is dark with some lighter, abstract shapes that suggest a landscape or sky.

Maine's super flyway

Can mass migrations survive a
changing Gulf of Maine coast?



2 Living Lightly

Practicing sustainable living requires re-evaluating how the choices we make in our daily lives affect the environment, economy and society, both universally and at a local level. The key to succeeding at sustainable living, says Catherine Elliott, is to make the best possible decisions for where we are in our lives.

22 Occupations Attract

Knowledge isn't just a factor that drives the economy. It is the economy, according to Todd Gabe. Using new occupational data and redefining traditional measures of human capital, Gabe's research on the knowledge economy is changing the way people view regional economic activity, especially in cities.

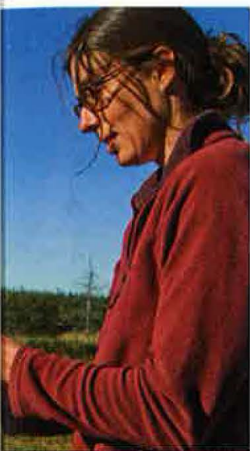
8 Songbird Superhighway

Twice a year, day and night, mass migrations occur in the Gulf of Maine. UMaine researchers and other scientists in the Northeast Regional Migration Monitoring Network are working to understand the phenomenon in light of current and emerging issues involving land development and alternative energy initiatives that could affect the migratory birds.

26 Willing and Able

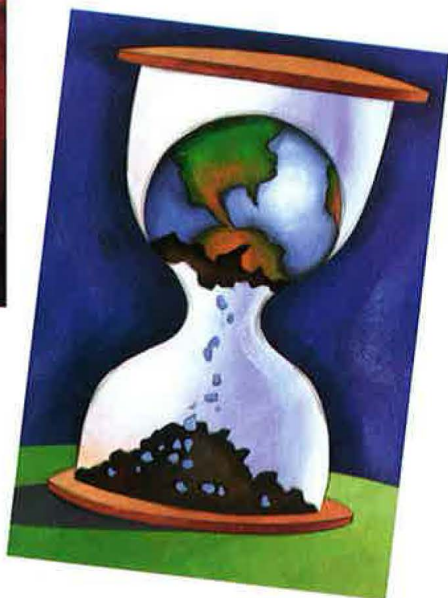
For nearly four decades — first as a teacher and early interventionist, later as a UMaine professor and today as a leading authority on inclusive education and public policy for those with developmental disabilities — Lu Zeph has been fighting to give children of all abilities an opportunity to learn.





16 Choosing Survival

In this country, the 18th-century Colonial wars were fought with swords and muskets. In the 19th century, the weapons were ink and paper as settlers petitioned for rights to the homeland of the Penobscot, Passamaquoddy and Maliseet. For their very survival, members of the Maine tribes learned to wield the same political tool.



departments

Student Focus	6
Alumni Focus	14
Connection	25
Insights	30

14



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In *UMaine Today* magazine, +Online indicates the availability of additional content — Web-exclusive stories, video and audio clips, photo galleries, full-length versions of article, and a comprehensive editorial archive.

President's Message

THROUGH THEIR research, University of Maine scientists and scholars pursue answers to society's most pressing problems, offering new perspectives on our world and making discoveries that inform and improve our lives. This issue of *UMaine Today* offers a cross section of some of those initiatives.



Biologist Rebecca Holberton and her research team have verified that the Gulf of Maine serves as a superhighway for songbirds migrating between Canada and South America. They are now part of an international network of scientists working to understand the mass migrations and the implications of changing coastal habitats.

In his graduate research on 19th-century Wabanaki petitions, Micah Pawling has provided a unique perspective on the struggle of Maine tribes to preserve their homeland — ethnohistory that has contemporary significance.

A new perspective also is found in the research of Todd Gabe and his colleagues, who are exploring the keys to economic development via knowledge clusters. Gabe is an economist known for asking new questions to extrapolate new answers from data.

Also impacting the state and national mind-set is Lu Zeph, whose research and advocacy have helped ensure community inclusion for students with severe disabilities.

These *UMaine* scholars and so many others exemplify contemporary applications of the land-grant tradition. By examining issues of importance to Maine and beyond, their work allows us to effectively address pressing concerns across a wide range of disciplines.

Robert A. Kennedy
Robert A. Kennedy
President



ON THE COVER: The Gulf of Maine serves as a major flyway for songbirds migrating between Canada and South America. Now an international effort involving University of Maine researchers is working to understand the mass migrations and how they may be affected by climate change, coastal development and alternative energy initiatives. See story on page 8.



Living lightly

By Jessica Bloch

Sustainability a key to improving quality of life

WHENEVER CATHERINE ELLIOTT talks to audiences across the state about sustainable living, she offers a two-part scenario to drive home her message.

She asks people to take their job income and subtract the costs associated with working, such as childcare, travel and work clothes. That's their real wage.

Then she asks them how they take that money and shop.

"If I buy an item that costs \$80 and I'm making \$8 an hour, I have to work 10 hours to pay for it," says Elliott, a University of Maine Cooperative Extension professor and founding member of the National Network for Sustainable Living Education (NNSLE). "Is it worth it? The answer might be yes, and it might be no. It might be, maybe I'll think about it."

And what happens if they buy this item on credit? In essence, they're paying for it with hours not yet lived.

And that, Elliott says, is a sort of aha moment — the point at which there begins to



It's not that every decision has to be the most sustainable decision, but that it's a conscious, intentional decision. It's thinking about your options given the reality of your situation."

Catherine Elliott

be an understanding of what it means to live sustainably.

Essentially, the practice of sustainable living is a reconsideration of what we think we know — a re-evaluation of how the choices we make in our daily lives affect the environment, economy and society, both universally and at a local level.

The key to succeeding at sustainable living, says Elliott, is to make the best possible decisions for where we are in our lives.

"It's not that every decision has to be the most sustainable decision, but that it's a conscious, intentional decision," Elliott says. "It's thinking about your options given the reality of your situation."

ELLIOTT HAS STUDIED sustainable living, or "living lightly," as she puts it, for more than eight years. In 2004, she helped found NNSLE, a group of Cooperative Extension faculty members from across the country dedicated to fostering new consumption patterns and sustainable lifestyles to improve quality of life and reduce environmental degradation. The group's goal is to educate and model sustainable living practices to individuals, families, institutions, businesses and schools on three fronts — society, economy and the environment.

The national network grew out of the Sustainable Living Project at Oregon State University, led by Forestry Extension Professor Viviane Simon-Brown, author of *Living Sustainably: It's Your Choice*. In 2008, the second edition of *Living Sustainably* was co-authored by Simon-Brown



Living lightly

and Cooperative Extension specialists from 10 states, including Elliott.

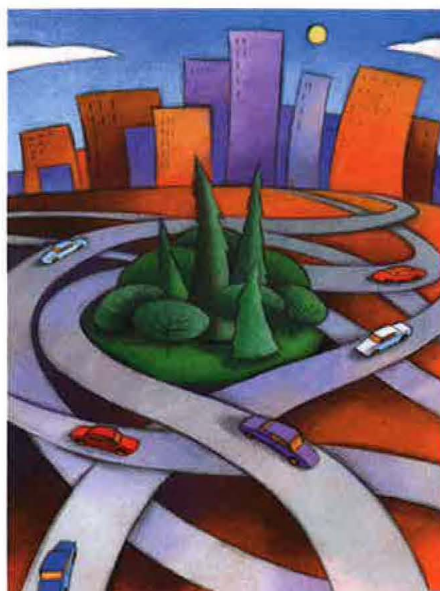
NNSLE defines a sustainable life as one that is deeply satisfying, fulfilling and appealing, while also environmentally, economically and socially responsible.

The environment, economy and society make up the so-called sustainability triangle, which Simon-Brown's group uses to show the interconnectivity of daily decisions.

We can build a sustainable lifestyle, according to NNSLE, by considering our consumption of goods in light of the finite environmental resources available. Sustainability follows the logic that if we have a desire to consume less, manufacturers will produce less, and therefore there will be less of an impact on the global environment and the individual wallet.

A sustainable lifestyle is not, however, based on guilt, depravation or doom and gloom. Elliott and other proponents of sustainable living aren't arguing that we need to deprive ourselves of purchases outside of our needs. They don't intend to make us feel guilty for less-than-sustainable choices in the past. And they don't seek to scare us about the future.

WHEN SHE SPEAKS to groups — from conservation organizations to organic farmers in Maine and meetings of Extension professionals nationwide — Elliott does ask people to put their individual actions into a global context. She wants people to think about how their daily lives impact the environment, economy and society in light of threats such as climate change, overpopulation, food supply issues and energy resource depletion, and



UnDriving

Do I really need to drive there? Right now? Alone?

Or can I ...

Share a ride with someone going to the same place or in the same direction?

Wait 'til I have other things to do along the way?

Walk? Ride a bike?

Take a bus or subway?

By Catherine Elliott, University of Maine

how those choices affect their wallets and stress levels, as well as the amount of satisfaction with life.

"I think one of the challenges is that it can very quickly become overwhelming, especially when you talk about world issues that are so big and so global," says

Elliott, who joined UMaine Cooperative Extension in 1987 after receiving a Ph.D. from UMaine, and who also serves as Extension's wildlife specialist. "It's very easy to get into a mind-set of, well, I can't do anything about that. But you can. It doesn't always have to be the most sustainable decision or done in the most sustainable or energy-efficient way, as long as it's a reasoned decision."

Yet many of us don't consider sustainable choices, according to Elliott. We claim not to have enough time in the day, which can lead to what she and her colleagues call time poverty. The consequences of that include loss of family time, obesity, anxiety, stress and even depression.

While we're wondering where all our time went, we're wondering how we have accumulated so much "stuff."

WHEN IT COMES to all that "stuff" — belongings that aren't necessities or don't make our lives truly happier or easier — Elliott suggests going beyond the well-known mantra of reduce, reuse, recycle to include repair, refuse and redistribute.

One woman Elliott knows did just that. During one of Elliott's talks, the woman mentioned she wanted new living room furniture even though her old furniture was still in good shape. A few months later, the woman told Elliott that she and her sister traded furniture.

"Neither of them had to buy new furniture," Elliott says, "and she got a whole new look without it costing her anything."

Making those kinds of sustainable decisions given the reality of our situa-

tions can be the key to getting our lives back and contributing to the alleviation of global environmental issues.

Say, for example, you own a truck you fill up with gasoline a few times a week for runs to the grocery store. You'd love to replace that truck with a new gas-electric hybrid vehicle, but such a purchase isn't economically feasible for the next year. Living sustainably means asking questions to find a solution to spending less money on gas and saving for the new car. You could think strategically about how to combine your errands into one trip. You could carpool with a neighbor. Public transportation might be an option.

You might find not only have you reduced the amount spent on gasoline, but also cut back on the time spent in your vehicle, which means more time at home. Because you're thinking how to shop strategically, you might find yourself buying less, or at least thinking before buying. And you've helped reduce traffic and pollution levels from your exhaust.

It's an outcome, based on decisions that fit with your lifestyle, that has had an effect on the sustainability triangle.

ELLIOTT ALSO has produced what she calls an UnDriving Card, based on a concept Simon-Brown first developed for an UnShopping Card. Roughly the size of a business card, the UnShopping Card lists a series of questions: Do I really need this? Could I borrow or rent it? Is it worth the time I worked to pay for it?

On the other side of the UnShopping Card is Elliott's UnDriving Card. Again, the card asks people to consider why they're making the decisions they are.



UnShopping

Do I really need this?

Is it made of renewable or recycled materials? Is it recyclable or biodegradable?

Could I borrow, rent or buy it used?

**How long will it last?
If it breaks can it be fixed?
How will I dispose of it?**

Is it overpackaged?

Is it worth the time I worked to pay for it?

By Viviane Simon-Brown, Oregon State University

Instead of driving alone, could I share a ride with someone? Could I walk, bike or ride public transportation? Do I really need to make this trip right now?

So what does a sustainable future look

like? To Elliott and other sustainable-living proponents, it's a world in which sound environmental decisions, prudent economic policies, and a peaceful and equitable society combine to help the planet thrive and grow.

In her own life, Elliott strives to live as lightly as she can. In 1994, she and her family built an energy-efficient home in Hampden, Maine, that is so well-insulated, it never gets below 55 degrees Fahrenheit — without any source of added heat. All it took were thick layers of insulation, a conscious building orientation and a roof overhang to admit or shade the sun, depending on the season.

Elliott's home isn't contributing to climate change or resource depletion the way oil- or wood-heated homes might, and her family is saving money on fuel.

However, Elliott acknowledges, no one lives perfectly lightly. Her home's solar water heater is environmentally sound, but is a more expensive initial investment. A recently added photovoltaic system was made a little more affordable by taking advantage of state and federal rebates and tax credits, and is further reducing the family's use of fossil fuels.

What's sustainable for one person might not be for another. But everyone, no matter his or her income or lifestyle, can do something to live more sustainably.

"It is an attitude shift, to realize that wherever you're at, whatever you do, there's one more thing you can do to live more sustainably," she says. ■



Do you *really* LOVE ME?

AH, YOUNG LOVE between a girl and a boy. So innocent. So much a part of coming of age. Such a romantic backdrop for the warning signs of depression. Adolescents and young adults who excessively seek reassurance in their romantic relationships are at increased risk for depression, according to a new psychological study at the University of Maine.

Excessive reassurance seeking — such as constantly asking, “Do you really care about me?” — is associated with poorer relationship quality and internalizing problems, especially for girls and young women, says UMaine Doctoral Research Fellow Jessica Fales.

In her research, Fales focused on three social processes: excessive reassurance seeking, negative feedback seeking and co-rumination or excessive discussion of personal problems with a tendency to focus on negative topics. She was especially interested in whether adolescents engage in these behaviors with their dating partners, and if that might help explain why involvement in romantic relationships is itself a risk factor for depression for girls.

Her study is the first to explore the three interpersonal factors simultaneously in the context of adolescent dating.

“Most intriguing was that in romantic relationships, we found that males engage in excessive reassurance seeking just as much as females,” says Fales, a fifth-year graduate student in the Psychology Department’s Clinical Ph.D. Program. “But females experienced more negative outcomes.”

Fales studied 110 couples ages 17-26 who had been in an exclusive romantic relationship an average of 12 months. The research showed that

**A new study finds the
warning signs of depression
in young romance**

both males and females engage in these interpersonal processes with their romantic partners, in most cases more so than they do with their friends. Greater excessive reassurance seeking, co-rumination, and poor romantic relationship quality each uniquely predicted depressive symptoms for young women.

For young men, the need for excessive reassurance, poor romantic relationship quality, and shorter relationship length predicted depressive symptoms.

Follow-up analyses revealed that excessive reassurance seeking impacts depression symptoms directly, over and above any effects of poor relationship quality.

The findings highlight excessive reassurance seeking as an important risk factor for depression in young men and women, Fales says, and suggest that it is not just a symptom of a dysfunctional romantic relationship.

Greater understanding of the social processes in adolescent romantic relationships and their implications for depression has the potential to improve intervention programs.

"In younger children, it's normal for them to seek reassurance," Fales says. "We don't know where the unhealthy line is, but a starting point is when excessive reassurance seeking starts to annoy other people, to the point that they begin to withdraw from the relationship."

"These are behaviors and can be changed. They can more readily be targeted through intervention. For example, because we know that dwelling on negative topics or problems with others can lead to depressive symptoms, we can talk to young people about more active problem solving."

Research and relationships


AS AN UNDERGRADUATE, Jessica Fales of Winslow, Maine, briefly attended Hamilton College, intending to major in English and, ultimately, teach. But when she took an Introduction to Psychology course, she developed a keen interest in abnormal psychology. She realized that the best place to further develop this passion was at the University of Maine.

When she transferred in 2002, Fales was one of the first undergraduates to be part of the Psychology Department's research-intensive track, working in the laboratories of professors Sandra Sigmon and Douglas Nangle, and being mentored by then doctoral students Teresa Edenfield and Agnieszka Serwik.

For her independent project, Fales used a large data set to explore whether social anxiety was a risk factor for dating aggression in college students. She found one component of social anxiety that stood out: fear of negative evaluation. For males ages 18–23, excessive concern of being negatively evaluated by others predicted psychological aggression toward their dating partner.

Fales took her research interests in dating, gender differences and internalizing problems into her graduate work, which she began in 2005 with Nangle as her mentor. She is interested in exploring factors that may contribute to adolescent females' increased risk for difficulties — factors that may be prime targets for intervention.

This summer, she will begin a required, highly competitive one-year predoctoral clinical internship in a medical center setting. And Fales is mentoring undergraduate Uriah Hedrich of Presque Isle, Maine, a double major in psychology and philosophy.



University of Maine graduate student Adrienne Leppold is one of the country's foremost bird banders. During the fall and spring migration seasons, she lives on Metinic Island off the Maine coast, conducting research there as part of the Northeast Regional Migration Monitoring Network. Through her research, supported by the U.S. Fish and Wildlife Service Maine Coastal Islands National Wildlife Refuge, Leppold made the important discovery that the island is a major flyway for songbirds.

Photo courtesy of Adrienne Leppold



Songbird superhighway

By Jessica Bloch

IT WAS 8:10 on a mild, clear October 2009 morning on Metinic Island in Penobscot Bay, and a group of University of Maine researchers was already several hours into a shift collecting, banding and analyzing songbirds migrating off the Maine coast. Rebecca Holberton, one of the nation's top bird biologists, had arrived several days earlier, joining UMaine graduate student Adrienne Leppold, who oversees banding operations on Metinic and is a key member of Holberton's Laboratory of Avian Biology. Leppold had already been on the island several weeks, going through a daily routine that included waking up before dawn to capture, band and eventually release songbirds, and then retreating to a small cabin to analyze data and repeating the process the next day.

That morning, Leppold was busy banding under a tent when Holberton called her outside. Leppold came tiptoeing out through throngs of birds amassed on the ground.

Look up, Holberton told her.

What Leppold saw was shocking and thrilling — multiple flocks, each made up of hundreds of birds moving west-southwest over the island. One flock of about 150 yellow-rumped warblers stopped and hovered briefly over the treetops west of the banding tent before splitting — half the flock coming down to land in the trees and the other half continuing on.

"I could almost feel them thinking. It was a moving experience," Leppold says, recalling the moment. "Most of these birds are nocturnal migrants, and this was 8:10 a.m. And there was the same insanity on the ground around us. That was the moment it hit me that this was something huge."

Huge, indeed. What Holberton saw that morning, and what Leppold substantiated while conducting research on Metinic, was that the Gulf of Maine serves as a sort of

Northeast Regional Migration Monitoring Network researchers work to understand a newly discovered avian thoroughfare in the Gulf of Maine

Songbird superhighway



superhighway for songbirds migrating between Canada and South America. It was a major find not only for Holberton's lab, but also for an international effort to document the movements of migrating songbirds in the Gulf of Maine.

The Northeast Regional Migration Monitoring Network, a cooperative of Canadian and U.S. nonprofit organizations, government agencies and university researchers such as Holberton and her team, has spent the last two years trying to determine how migrating species use the Gulf of Maine's complex system of islands and coastal areas. Mingling decades-old monitoring techniques and newer technologies, researchers are examining migratory movements made by large groups and individual birds.

"We're combining techniques and technology for tracking small birds," says Holberton, a UMaine associate professor of biological sciences. "With the monitoring network and the sites all over the Gulf of Maine, we can couple all these approaches across scales."



Most of these birds are nocturnal migrants, and this was 8:10 a.m. And there was the same insanity on the ground around us. That was the moment it hit me that this was something huge."

Adrienne Leppold

IN ADDITION to the groundbreaking nature of the findings and combination of research methods, the collaborative nature of the Migration Monitoring Network itself is unheard of in the world of bird migration research in the Gulf of Maine.

Faculty and student researchers from UMaine and Acadia University in Nova Scotia are involved, along with U.S. Fish and Wildlife Service biologists at the Maine Coastal Islands National Wildlife

Refuge, the National Park Service and several established bird banding stations, such as Atlantic Bird Observatory in Nova Scotia, Appledore Island Migration Banding Station in Isle of Shoals, and Manomet Bird Observatory in Massachusetts.

Network researchers are now collecting data about the species and numbers of birds captured on the migration highway, as well as point of origin and destination. The network's goal isn't to simply amass information. Scientists want as clear an understanding as possible about the gulf's migrants because current and emerging issues such as climate change, loss of habitat through development of inland and coastal areas, and alternative energy initiatives along the Maine coast will inevitably affect the mass migrations.

"We're at the northern end of their spring migration, so of course the birds that we get would be breeding north of us," says Holberton, who also is part of the ecological monitoring team working on UMaine's DeepCwind Consortium, the offshore wind power initiative. "Those are

Songbird superhighway

To describe three different types of stops migrating birds tend to make, Holberton uses terminology known in bird biology circles. Some landing spots are known as fire escapes — places where birds stop for a few hours to get a quick rest or reorient themselves after having been blown off course, but aren't suitable for long stays because of lack of food or shelter from predators. Then there are the so-called convenience stores, which have easily accessible resources for birds. Here they can rest briefly for a day or two before moving on to better sites, maintaining or improving their condition and increasing the odds of reaching their destinations. The third type of spot is the five-star hotel, a place where birds can stop for a week at a time to rest, feed and fatten in order to make long pushes on their migratory travels.

Holberton and her researchers have determined that Petit Manan and Seal islands fall into the fire escape category, offering critical places to rest, while Metinic falls into the convenience store analog. Fortunately, there are also five-star hotels in the Gulf of Maine. All the areas are regarded as critical habitats for migratory birds.

Identifying those locations in the gulf is one of the big pieces of researchers' work. When hot spots such as Metinic have been plotted, scientists will know which areas and the flyways connecting them should be protected from development or coastal wind turbines.

WHEN BANDING, Leppold sometimes takes a tail feather or small amount of blood from the birds. From those biologi-



Taking the weights of songbirds, including their subcutaneous fat, is important in determining their health. The researchers can use the fat amounts, as seen through the skin in the bird's neck, and body weight to get an idea of its energetic condition. If a bird has more fat on its body than normal, taking into account its mass, researchers can extrapolate that the bird is in good energetic condition and is piling on weight to prepare for long migration flights. If a bird is lacking in fat, it may be at the end of a migration or has been unable to put on enough weight for a long trip. The better energetic condition, the longer a bird can go in the air, which means taking shorter routes by cutting across bodies of water where there are few opportunities to land.

cal materials, the UMaine researchers have been able to determine where birds were born or bred by looking at the stable

isotope signatures of those samples. This information informs the Migration Monitoring Network's research by revealing more about birds' travels.

"By also measuring stable carbon isotopes, which can vary with habitat type, in the same tissues, you can start putting another coordinate on where that bird was," Holberton says. "We're taking these different tissues that give us a different time stamp, and we're putting together a composite of stable isotope signatures that help give us some information."

Blood samples also are tested for indications of the birds' immune health and energy metabolite levels are checked for changes in behavior and physiology.

"A lot of times we see a situation where birds are not fighting an infection yet, but they're under some kind of stress, whether the stress is from bad weather or crowded conditions, or they can't find enough food," Holberton says. "They can become immunosuppressed and more susceptible to infection and disease. Things that you might normally have thrown off, like a cold, can kill you."

Another important element of research is data picked up by both radar and passive acoustic surveys. The acoustic data, gained through recorder arrays throughout the Gulf of Maine coastline and inland, give researchers an idea of which species of birds are flying overhead, especially at night.

As birds move through the sky, they call to each other via a series of short, usually high-frequency noises, many lasting a mere hundredth of a second, which sound to us like clicks or chirps. An interactive sound analysis software system

"These birds that travel well beyond the Gulf of Maine are very good at what they do, but it might not take much more than one thing to push them over a threshold at which they can no longer sustain their populations. That's the issue."

Rebecca Holberton




called Raven, developed at Cornell University, translates each call into a spectrogram or visual picture of the sound. UMaine undergraduates in Holberton's lab compare each bird's song picture to standard, confirmed images of a species' spectrogram to make identifications.

THE NETWORK'S research is expected to offer a clear picture of how migratory songbirds and other migratory species, such as waterfowl, seabirds and shorebirds, use the Gulf of Maine. Evolutionary changes in birds likely won't keep up with human alterations to landscape, but at least scientists will know what species are flying through the area, how the birds are using different areas of the gulf, and how their numbers may be changing in the face of environmental challenges.

While climate change is one of the biggest potential threats to migrating birds in the Gulf of Maine, it isn't the only one. Land development along the coastline could change how birds use their stopover sites; the gulf could see more areas with

fire escape capabilities, for example, and fewer five-star hotel zones — a situation that could not sustain successful migrations of millions of birds annually.

Holberton, her team at UMaine and the rest of the network researchers hope their findings will be used to support responsible development in and around the Gulf of Maine, especially now that researchers such as Leppold have shown the region is a superhighway for songbirds and other species.

"Maine desperately needs a comprehensive, long-term plan for coastal and offshore development that takes into account not only our region, but those north and south of it," Holberton says. "These birds that travel well beyond the Gulf of Maine are very good at what they do, but it might not take much more than one thing, such as loss of critical migratory habitat in addition to loss of wintering and breeding areas, to push them over a threshold at which they can no longer sustain their populations. That's the issue." ■ 

Rest stops

UNIVERSITY OF MAINE research professor Brian Olsen's primary interests are in big concepts of avian evolution, but his role in the Northeast Regional Migration Monitoring Network is on a much smaller scale. Last fall, the UMaine bird biologist led three bird banding stations, including two in Acadia National Park being monitored by UMaine graduate students, with more than \$63,000 in funding from the National Park Service.

Olsen's research team is attempting to link the locations of bird sightings to the types of habitats — coastal, wetland, field and forest.

"We want to know how birds are using the different habitats as they're moving through the area," says Olsen. "If we're losing forest or gaining wetland, or losing or gaining any other type of habitat, we want to know what we would expect to happen to the birds."

Some Like It



*UMaine alumnus grows
some of the world's spiciest chiles*



A WARNING comes with the Dorset Naga, one of the chile pepper varieties agronomist Michael Michaud sells through his mail-order seed company in England, Peppers by Post:

"Please use with the greatest of caution. Under no circumstances should one of these chiles be left where an unwitting person, especially a child, might handle them."

Michaud, an East Millinocket, Maine, native who graduated from the University of Maine in 1975 with a degree in plant sciences, and his wife, Joy, have spent four years developing the Dorset Naga in greenhouses and poly-tunnels at their home in West Bexington, Dorchester. The wrinkled, wedge-shaped red peppers "with a distinctive fruity aroma" have heat levels averaging around a million Scoville heat units (SHU).

To put that in perspective, Tabasco red pepper sauce is 2,500–5,000 SHU; ordinary jalapeños, 2,500–10,000 SHU.

The Michauds also grow dozens of other unusual, colorful fruits and vegetables, including hybrids, for their other mail-order business, Sea Spring Seeds, as well as "bonsai" chile plants for

kitchen windowsills. Michaud is a garden writer and, for the last decade, has been researching the vegetables and herbs found in immigrant shops and gardens. He not only writes about his findings, but also includes some of the varieties in his seed catalog.

We asked Michaud to talk about his hot commodities and his career.

How popular is the Dorset Naga?

We have an international clientele, with customers in Australia, Africa, Thailand and Europe. Did I mention the U.S.? My brother is the official importer, and he sends the orders out for us from his home down South. We produce thousands of Dorset Naga seeds each year, most of which we manage to sell.

How did you get started in the mail-order seed business?

We have been in the growing business for more than 20 years. Peppers by Post has been under way for 13 years; Sea Spring Seeds, four or five years. After developing the Dorset Naga chile, we decided to produce seeds of it ourselves. We started Sea Spring



Michael Michaud with his Dorset Naga chile peppers

Photo courtesy of Michael Michaud

Seeds as a way of selling the seed, and in the last two or three years have added more varieties to our catalog.

How does one create new lines of peppers?

We develop ours in two ways: from accidental crosses that occur between two varieties growing in the same greenhouse and from land race varieties collected in immigrant shops. We could make our own crosses, but so far, this has not been necessary.

Do you personally eat hot peppers?

Until we started selling fresh chiles, we had very little to do with chiles. We still don't like scorchingly hot food, preferring to eat the larger, milder chiles instead of the smaller, hotter ones.

How do you eat or cook with red hot peppers like some of the extreme varieties you produce?

The Dorset Naga is derived from the Bangladeshi Naga Morich chile pepper. The Bangladeshis seldom cook with it. Instead, they either rub it over their plate before the food is served or nibble on

the fresh fruit as they eat their food. They also eat it green because it has less heat than when it is red.

How do you cool the burn if the pepper is too hot?

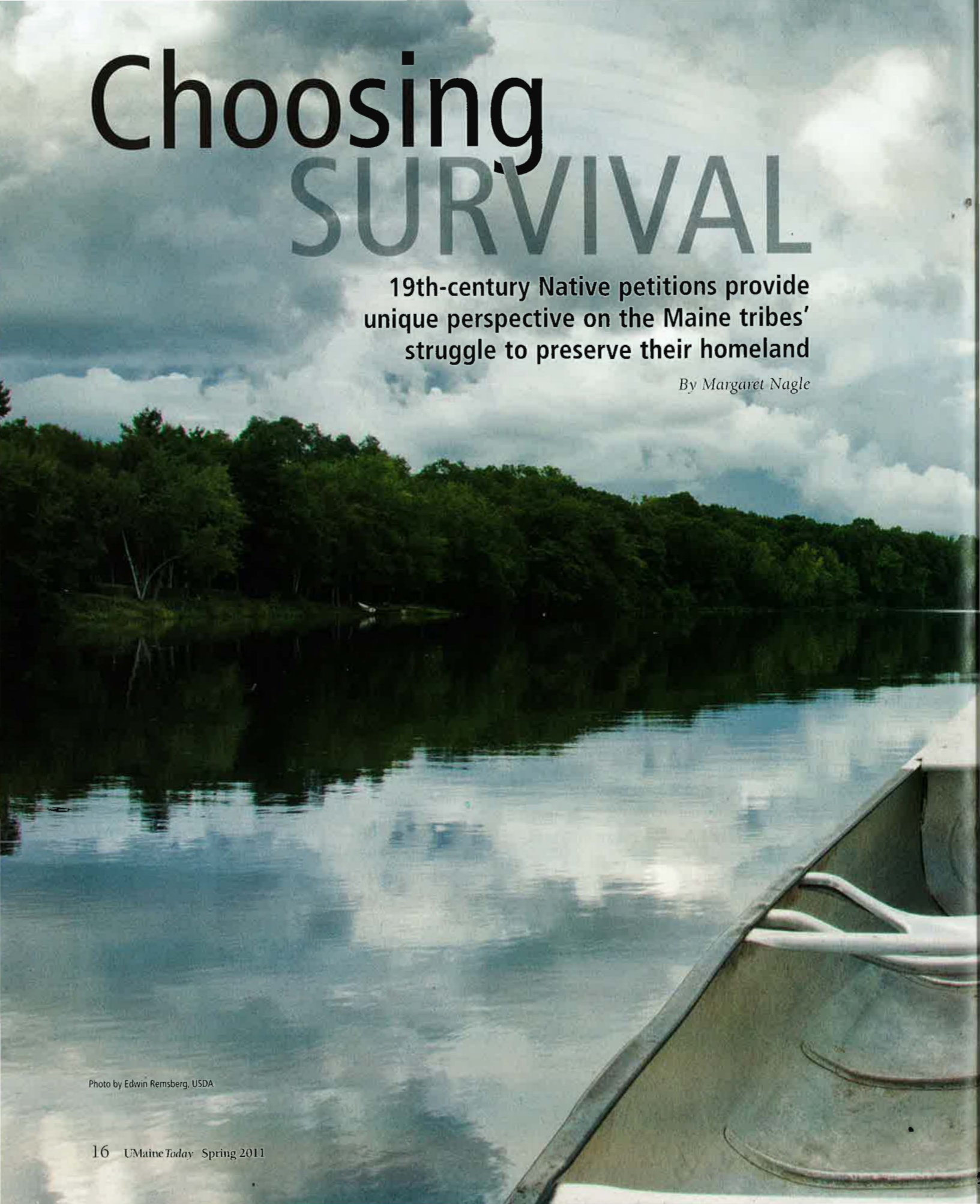
They say dairy products. My Bangladeshi friends offer me yogurt if they see me struggling from too much chile.

Do you have a favorite spicy dish using these extreme peppers?

No. The hot ones are just too hot. Chiles should be used to enhance the flavor of food, not detract from the enjoyment.

How did your UMaine experience shape you?

Career-wise, my UMaine experience did everything to shape me. Good teachers and interesting classes stimulated me to pursue a career in agriculture. And agriculture has been great fun: Peace Corps in El Salvador; a master's from the University of Florida; Ph.D. from Texas A&M; research and teaching at the University of the Virgin Islands; international inspector for the organic industry; vegetable grower; garden writer. It doesn't get much better.

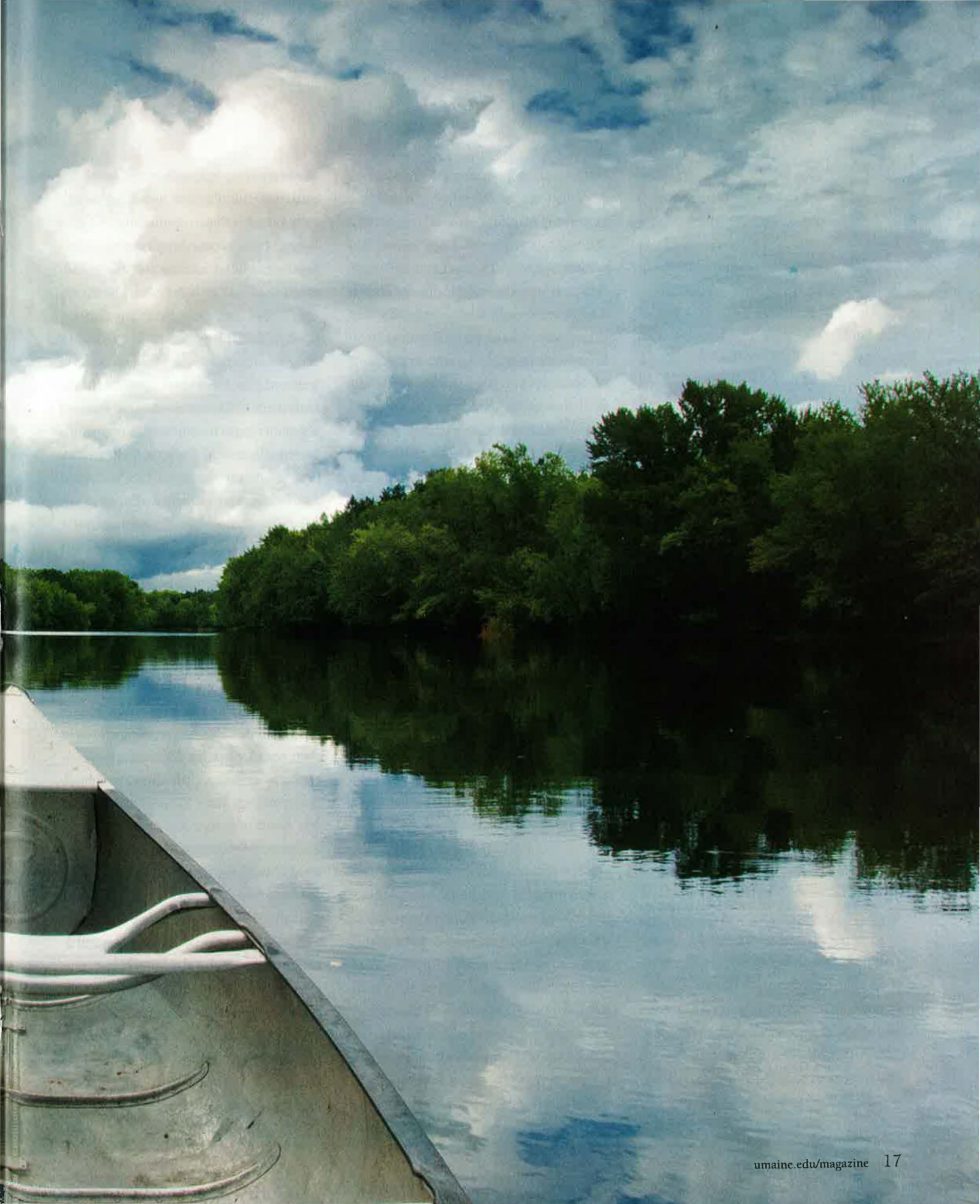


Choosing SURVIVAL

**19th-century Native petitions provide
unique perspective on the Maine tribes'
struggle to preserve their homeland**

By Margaret Nagle

Photo by Edwin Remsberg, USDA



Choosing survival

THE WHIRLWIND of change in the Wabanaki homeland of the Passamaquoddy, Penobscot and Maliseet tribes began after the Revolutionary War. In 1783, British loyalists and American immigrants began staking claims to eastern lands in the region of Massachusetts known as the District of Maine, petitioning the Commonwealth for property and water rights.

Through a series of treaties with Massachusetts, the tribes had retained reservations and usufruct rights that recognized traditional use of the land and water. Native leaders had relied on traditional face-to-face communications at treaty negotiations and conferences between Native delegates and Euro-American officials.

But by the 19th century, when formal meetings became less common, the Penobscots, Passamaquoddies and Maliseets in present-day eastern Maine, western New Brunswick and the southern shore of Quebec had to navigate a new and ever-changing geopolitical landscape. With their very survival on the line, the tribes learned to use petitions as a political tool that not only kept the door of diplomatic negotiations open, but also served as a way to assert concerns and articulate aboriginal rights to governments.

The result was a remarkable paper trail that provides a unique perspective on the Maine tribes' struggle to withstand an invasion that resulted in a reconfiguration of aboriginal homeland — the process of Euro-Americans applying their own rearrangement of space to tribal lands and waters, including bridges, roads, property

boundaries, and fences or stone walls.

Today, the ethnohistory revealed in a University of Maine research project on 19th-century Wabanaki petitions has contemporary cultural and political significance. It provides context for the formation of reservation lands, suggesting that these places held significant cultural importance among the communities.

Native petitions speak not only to the challenges to their lands and lifestyle, but to the tribes' ability in wielding petitions as a political medium. The petitions are filled with their voices and values, including the place-names of the important sites and valuable hunting and fishing grounds they fought to preserve.

"In the 17th and 18th centuries, Colonial wars were fought with swords and muskets. By the 19th century, the weapons were pen and paper."

Micah Pawling

The research also provides important documentation for the Passamaquoddy tribe's long, ongoing efforts to gain federal recognition in Canada — an acknowledgment that the international border between eastern Maine and western New Brunswick cut through the heart of Passamaquoddy homeland.

"In the 17th and 18th centuries, Colonial wars were fought with swords and muskets. By the 19th century, the

weapons were ink and paper, involving settlers petitioning for Indian lands and rights, and Indians responding to assert their rights," says ethnohistorian Micah Pawling, whose research recently culminated in a Ph.D. in history at UMaine.

AS A YOUTH, Pawling was captivated by the Abenaki history of his home state of Vermont. He was an undergraduate at the University of Delaware when he received a summer grant to conduct research at the Maine Historical Society in Portland, Maine, for his thesis on the Wabanaki Confederacy, an intertribal alliance of the Abenaki, Penobscot, Passamaquoddy, Maliseet and Mi'kmaq.

That interest in the Wabanaki history brought Pawling to UMaine. His master's research examined the role of petitions in the cultural survival of the Maliseet and Passamaquoddy in the 19th century. Pawling's dissertation research, completed last spring, is a cross-border analysis of Wabanaki petitions and reconfiguration of their homeland in the 19th century.

"Similar to the work of my undergraduate professor Brian Hosmer, my work is less about resistance and accommodation and more about Native people making choices that affected their daily lives," says Pawling, who is the special research assistant at UMaine's Canadian-American Center, working on the upcoming publication of the *Historical Atlas of Maine*.

In his research that took him to archives from Ottawa, Canada, to Augusta, Maine, Pawling pored through hundreds of Native petitions and others by Euro-Americans that pertained to aboriginal issues. Many Wabanaki peti-

THE PENOBSCOTS were the first tribe in eastern Maine to adopt the Euro-American practice of submitting written petitions to government officials. To use petitions, members of the Native community had to “become familiar with the unfamiliar and try to use it to their own advantage,” says Pawling. Ultimately, as petitions in the early 1800s became a steady communication link between the tribes and governments, the documents clearly demonstrate a sophistication,

The tribes tried to use the system and “hoped for the best,” Soctomah says. “There were some benefits that gave hope to the tribes that someone heard their

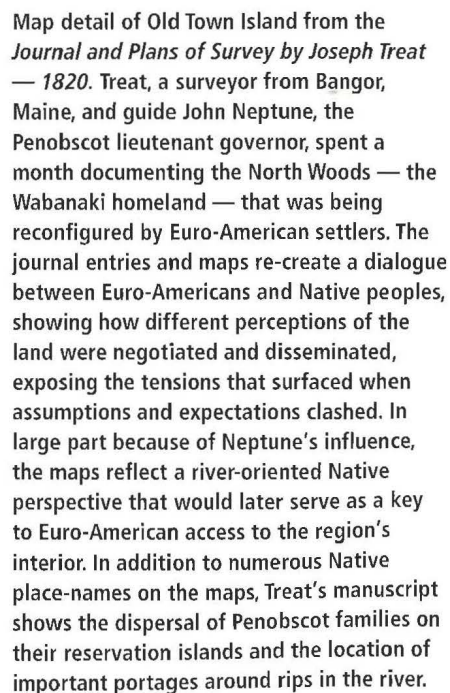
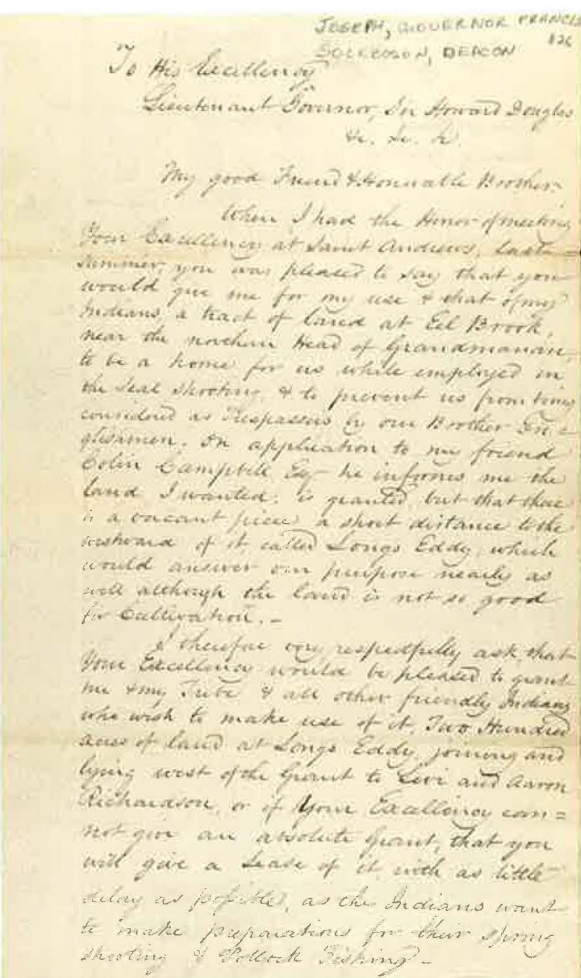


Image courtesy of Maine State Archives

Choosing survival



An example of a 19th-century Native petition is this 1826 request for a 200-acre reserve on Grand Manan Island. Passamaquoddy Gov. Francis Joseph and Deacon Sockboson of Pleasant Point, Maine, petitioned New Brunswick Lt. Gov. Howard Douglas for land at Eel Brook, near Northern Head on the island. The land grant would not only prevent families from being accused of trespass in their homeland, but would be home to the Passamaquoddy as they hunted seals and fished for pollack in the spring.

Image courtesy of the Provincial Archives of New Brunswick
RS108 Land Petitions: Original Series, Francis Joseph 1826

concerns. They wanted to be able to survive without interference. It showed their dedication to live and be free.”

ONE OF THE most significant contributions of Native petitions is their ability to speak through the ages about important tribal homeland sites — locations valued as gathering places for family bands, as sources of natural resources for subsistence and as places of spiritual significance. The tribes fought hard to hold onto these areas, such as the islands in the Penobscot and St. Croix rivers.

The notion that reservation lands were undesirable places that Native people were pushed to is not necessarily so in Maine, Pawling says. “It’s a different way of looking at the land and water that many Euro-Americans didn’t understand,” he says.

In their petitions, tribal members talk about these places and why they’re important, says Soctomah. The petitions also are a vital source of the aboriginal language, including place-names characterizing sites and geographic features.

In 2002, Soctomah and UMaine anthropologist David Sanger led a research initiative, “Landscapes and Language: A Passamaquoddy Place-Name Project,” that resulted in the addition of new place-names to the Passamaquoddy-Maliseet Dictionary, compiled by Passamaquoddy elder David Francis Sr., and linguist Robert Leavitt, published by University of Maine Press in 2008. Some of the rediscovered place-names are sacred and culturally significant to the tribe and not public.

The springboard for the project was Soctomah’s personal knowledge and his

historical research, Sanger’s extensive archaeological work on both sides of the international border in the Passamaquoddy homeland, and the comprehensive document research conducted by Pawling, including the Native petitions and surveyors’ journals.

WHEN PAWLING began researching Native petitions for his thesis, he learned about the journal of Joseph Treat of Bangor, Maine, who complied with the governor’s order to survey the lands bisected by the Penobscot and St. John rivers. Treat’s more than month-long expedition in 1820 was made possible with the cooperation of guide John Neptune, the Penobscot lieutenant governor.

“Treat was a local man, but in contrast to many of his contemporaries, he was interested in the human landscape,” Pawling says. “Some specific examples include Pamola’s Rock, where offerings were made to Mt. Katahdin, Penobscot eel fishing camps, and the extent of isolated American settlement up the Penobscot River. Treat and Neptune knew and respected one another. Treat was entering the Penobscot world where Neptune taught him appropriate behavior for survival.”

As a non-Native ethnohistorian, Pawling has done the same. Beginning in 2004, Pawling met regularly with representatives from the Penobscot Nation’s Department of Cultural and Historic Preservation, at that time led by UMaine alumna Bonnie Newsom, who now serves as the Penobscot tribal historic preservation officer. They reached their collaborative goal by publishing Treat’s journal, complete with

his hand-drawn maps and written descriptions of what is now northern Maine — an account of the North Woods 26 years prior to Henry David Thoreau's journey into the region.

"The project was valuable on two levels," says Newsom, who received her bachelor's degree in anthropology in 1995 and a master's degree in Quaternary studies in 1999. "First, it serves as a model for folks in academia who are interested in community-based partnerships in research. The community-based process involved in the Treat publication shows that community partnerships are possible and can be very successful.

"Secondly, it makes indigenous people visible in history," she says. "Micah places a lot of emphasis on the role of Native people in Treat's work. The journals could have been published without that emphasis, but Micah's analysis and interpretation of them highlight the fact that indigenous people were dynamic participants in Maine's history."

THAT PASSION to understand the culture is what sets Pawling and his research apart, says Soctomah.

"I've met a lot of researchers," he says. "I grew up seeing them on the reservation doing research, interpreting as they want and leaving, never to be seen again. Micah's special because he brings in the community. I've never met a researcher that in tune with his work and the concerns of the Native people. In that way, he gets the full picture. He's a specialist in Wabanaki research. What's also important is getting back the information he finds — information pertinent to the (recognition)

case in Canada, to cultural significance and to the education of our children."

Today, the Passamaquoddy tribe continues to petition the Canadian government for recognition. Some of the 19th-century documents discovered through Pawling's research could play a role in proving the existence of the aboriginal communities through time.

"Passamaquoddy petitions reveal that the people strove to preserve connections with the eastern portion of their homeland in Charlotte County, New Brunswick," Pawling says. "With family bands hunting and fishing across the international border, the tribe maintained a sense

"People and places may change, but the challenges of land retention, rights and cultural misunderstandings don't go away."

Micah Pawling

of homeland that included obtaining a foothold in New Brunswick, even though the province had refused to recognize them as Canada's First Nations peoples."

The 1783 Treaty of Paris established the border at the St. Croix River, but uncertainty as to the true location of the river led to a boundary commission, which relied on Passamaquoddy testimony, resolving the dispute in 1798. The international border cut the Passamaquoddy homeland in two.

"I've had several meetings on

Passamaquoddy land claims in Canada in which we're asked to show evidence that our community was here. The petitions serve as our foundation for obtaining Canadian recognition," Soctomah says.

"I've been fighting for 15 years, carrying on from the people before me. The stuff that Micah found gives us a strong voice. Every time there's a change in government in Canada, we keep talking. I can never give up hope, like my ancestors never gave up hope."

Soctomah also ensures that the wishes of his tribe are heard in Augusta. As a tribal representative in the Maine legislature for eight years, Soctomah wrote resolutions that reflected the wishes of the Passamaquoddy Council.

"That becomes my petition," he says, "to go after changes. It's a similar process within a system."

Measuring the outcomes of petitions in the past isn't as simple as counting up how many were granted, Pawling says. Petitions rejected by governments could be followed up by negotiations resulting in partial fulfillment of the request, and some petitions that governments granted were never enforced.

"Petitions also reveal why Native people are still concerned with land loss today," Pawling says.

The hope, he says, is that his research shows the complexity of the past and contributes to an understanding of the ethnohistory of the Native communities and their ongoing issues.

"People and places may change," he says, "but the challenges of land retention, rights and cultural misunderstandings don't go away." ■



Occupations attract

By Kristen Andresen

Research on knowledge-based clusters goes beyond college degrees per capita to give a clearer economic view of a city and region

THEY SAY who you know is as important as what you know. But University of Maine economist Todd Gabe has turned this slogan on its side. His research is based on the premise that what you do is a reflection of what you know. What you know is as important as how much you know. And all of this is as important as — and can dictate — where you are.

Knowledge isn't just a factor that drives the economy, it is the economy, say Gabe and his colleagues in their recent "Knowledge in Cities" study, released by the Federal Reserve Bank of New York and the Martin Prosperity Institute.

While many reports point to educational attainment as an indicator of a region's economic activity, that's only part of the picture. Gabe, whose recent work includes collaborations with creative economy guru Richard Florida's think tank, argues that the types of knowledge people possess are as critical as the percentage of college graduates in a given area.

"With the shifting economy, all you hear is, 'You need a well-paying job. You need a college degree.'" Gabe says. "This goes beyond that. Maybe not all degrees and types of cognitive skills are created equally."

The median salary for a recent engineering graduate is about \$25,000 more annually than that of a liberal arts major, according to an annual survey by UMaine's Office of Institutional Studies.



This work gives regions an idea of the strength of their niche in the economy and how it contributes to productivity and economic activity."

Todd Gabe

The skills a marine biologist needs to graduate are far different from those required by a fine arts major. And there are certain well-paying occupations — plumbing comes to mind — that don't require a college degree at all.

To complicate things even further, two regions may have a comparable percentage of residents with college degrees, but

those places may have very different strengths. There's a reason why aspiring actors flock to Los Angeles or New York City and software geniuses move to Silicon Valley.

By using new occupational data — and redefining traditional measures of human capital — Gabe's research on the knowledge economy is changing the way people view regional economic activity.

"Todd Gabe is among the most facile people in the world in handling occupation data and relating that to regional economic outcomes," says Florida, director of the Martin Prosperity Institute at the University of Toronto and author of *The Great Reset* and *The Rise of the Creative Class*. "His work is providing a serious, economic investigation into the value of occupations on economic output."

To give a clearer picture of how the skills of a region's workforce affect economic development, Gabe and his colleagues Jaison Abel, Adrienne Ross and Kevin Stolarick created regional knowledge profiles in their "Knowledge in Cities" report. There are Making Regions, such as the manufacturing hub of Detroit, Mich., and there are Teaching Regions, such as the college town of Athens, Ga. Portland, Maine, counts as a Thinking Region because people there have high

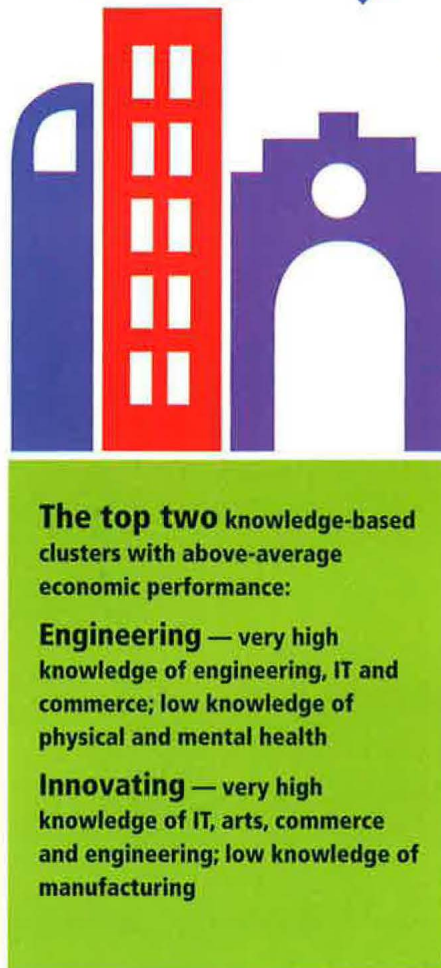
knowledge about the arts, humanities, IT and commerce.

"This work gives regions an idea of the strength of their niche in the economy and how it contributes to productivity and economic activity," Gabe says.

Learning more about these knowledge clusters gives a richer, more detailed view of a region's economic strengths and weaknesses. For example, it would seem like living in an area where there are a lot of doctors would be a boon to everyone who lived there. But from an economic standpoint, it may just be good for the doctors, Gabe says. Prosperity in the technology sector, on the other hand, tends to improve the overall economic outlook for a region, because — for example — the presence of computer programmers and IT specialists makes the people around them more productive.

Gabe's interest in understanding the economic strengths of regions and how they contribute to productivity and economic activity springs from his research on the creative economy in the early to mid-2000s. Florida's best-selling book, *The Rise of the Creative Class*, had just come out, creating buzz in Maine and nationally. Gabe conducted a few studies on the creative economy and that research evolved into his work on the knowledge economy, which caught Florida's attention. Several years ago, Florida invited Gabe to give a presentation at the Martin Prosperity Institute.

"As an affiliate of the Martin Prosperity Institute, Todd brings a diverse set of research and interests and expertise that makes the institute's work that much richer," Florida says.



Gabe then collaborated with MPI researchers on the "Knowledge in Cities" article, which *The Economist* highlighted as one of the most interesting studies in September 2010. Gabe also recently completed a book chapter, "The Value of Creativity," which will be published later this year in the *Handbook of Creative Cities*.

Gabe's creative economy research led him to look at occupations — rather than industries — as an indicator of a person's skills (it makes sense that a webmaster at a paper mill has more in common with a webmaster at a university than he or she

does with others who fall under the "manufacturing" label). From there, the leap to "knowledge areas" — trying to identify which types of skills have a higher value in the market — wasn't very big.

"The questions I'm asking haven't changed," Gabe says, "I'm still searching for the keys to economic development."

At first, Gabe looked at the big picture: What impact does knowledge have on a person's earnings? Then he started digging a little deeper to find out what impact knowledge had on the earnings of others, what he and his colleagues call the spillover effect.

"Now, I'm really interested in how these types of indicators affect geographic patterns of economic activity," Gabe says. "Is there clustering of various types of knowledge? And how can this be applied in a practical sense?"

Though his research is helpful for individuals and policymakers, Gabe is interested in making the findings applicable to the business community.

He is currently researching the effects of population density on productivity through the lens of human capital — yet again looking at the data in a way nobody has before. He'd also like to come up with a way to see how the factors he's researching today have affected economic growth over time.

"It would be really interesting to be able to go back in time and develop knowledge profiles and see how they affected growth," Gabe says. "The occupations we have today are very different from the occupations we had 30 and 40 years ago. Even the way the jobs are done are different." ■



**An education
program helps
jail inmates
stay connected
to their children**

Dad
Two Bridges Regional Jail
Wiscasset, Maine 04578

Parenting from away

TRAVIS' DAUGHTER was 6 months old when he went to prison for burglary almost nine years ago. Now two weeks before being discharged from Two Bridges Regional Jail in Wiscasset, Maine, he is filled with anxiety about transitioning into a parental role.

"She's grown up a lot," says the 28-year-old. "I try to write her and call her as much as I can. I'm hoping to get her for the summer. I'm a little nervous about it. I don't know what lies ahead, so I've got to prepare."

For Travis and about 100 other inmates at the Wiscasset jail, a parenting education class offered by University of Maine Cooperative Extension is helping ease prerelease transition apprehension. Parenting from Away features three-week sessions focusing on how to stay in contact with families through letters, phone calls and other means. Parents are encouraged to talk about issues and concerns they have about reconnecting with families and children, about authority, discipline, expectations and conflict, and making the most of visitation with games, singing or reading aloud with donated children's books.

The class at Two Bridges is voluntary and typically attended by men, because of the small female population. It has a 90 percent completion rate.

"Parents in jail need to learn how to stay connected," says Kristy Ouellette, an Extension educator in 4-H youth and family development in the Androscoggin-Sagadahoc counties office who teaches the Parenting from Away classes.

"It's not important why they are in jail, just that they are trying to communicate with their children. They need to know how to tell children about what jail is," she says. "It's all about the relationship and trust, and finding out how they can be the best parents they can be with the cards they've been dealt."

Inspiration for Parenting from Away came from jail staff who recognized the need for parents in jail to learn about parenting and children's development. Ouellette helps the inmates understand and avoid communications barriers and set goals.

Parenting from Away is modeled on similar education programs for inmates nationwide. They include a parent education program for incarcerated mothers in Colorado, which has demonstrated that inmates who took the classes had better attitudes and were less likely to reoffend.

Nationally, 70 percent of jail or prison inmates have children or have visitation rights with children. Helping inmate parents stabilize their lives and reunite successfully with children through education goes a long way toward reducing future offenses, Ouellette says.

Willing and able

For nearly four decades, Lu Zeph has championed community inclusion for students with severe disabilities

By Kristen Andresen

LU ZEPH'S OFFICE is a maze of books, grant paperwork and research articles. A sculpture of a flying moose is suspended from the ceiling.

Why the sculpture? Well, most of what Zeph has accomplished — first as a teacher and early interventionist, later as a UMaine professor, and today as a leading authority on inclusive education and public policy for those with developmental disabilities — were the types of things that were only supposed to happen when moose could fly.

Zeph has made the impossible possible for nearly four decades.

When she started her career in the early 1970s, children with severe disabilities were either segregated or forgotten when it came to education. Many were placed in institutions or nursing homes. The general assumption was they couldn't learn, so why bother? Others were sent to "special" schools.

Neither of these options sat well with Zeph.

"The education of children with severe disabilities is even more critical because it affects their whole quality of life," says Zeph, director of the University of Maine's Center for Community Inclusion and Disability Studies (CCIDS). "What these kids mostly needed was what other children already had — the opportunity to learn."

To say Zeph has been involved with nearly every major advance in education for students with severe disabilities would not be an overstatement. She has advised Congress on landmark legislation. She has served in leadership roles in national associations. She was a sounding board for mainstreaming in Maine schools. In 1999, she was awarded a prestigious Kennedy Public Policy Fellowship in Washington, D.C., and was later called back to Washington for a year to serve as executive director of the Joseph P. Kennedy Jr., Foundation.

Timeline: Critical Events Related to the Evolution of Inclusive Education in Maine and the U.S.

1954 Brown v. Board of Education, a Supreme Court decision that established the rights of all children to participate in unsegregated education. Established that children could not be segregated by race. This law became the basis for later lower court decisions related to access to education for children with disabilities.

1961 President John F. Kennedy appoints a President's Panel on Mental Retardation.

1966 President Lyndon Johnson establishes the permanent President's Committee on Mental Retardation, now known as the President's Committee for People with Intellectual Disabilities.

1970 Passage of the Developmental Disabilities Services and Facilities Construction Act amendments, establishing the federal definition of developmental disabilities and what has become a national network of University Centers for Excellence in Developmental Disabilities Education, Research and Service.



Lu Zeph

Willing and able

At UMaine, she developed the master's specializations in severe disabilities and early intervention, and coordinated the undergraduate and graduate interdisciplinary concentrations in developmental disabilities that are now a part of disability studies. She is the driving force behind CCIDS, which has brought in more than \$50 million in grants since 1992.

"The field of severe disabilities and I grew up together, and at each point where it needed to evolve, my thinking was typically way ahead of where things were," says Zeph, who joined UMaine's education faculty in 1979 as coordinator of graduate study in severe disabilities. "I had a reputation, both in the state and nationally, for pushing the envelope and wanting more, expecting more and trying to create more."

EARLY IN HER career in Maine, no program was legally required to serve preschool children with disabilities. But in four counties of midcoast Maine where she was running one of the state's first programs in early intervention, Zeph made sure they did. With little funding and often few resources, she'd barter. For example, if a preschool would give a child with disabilities a place in its program, she would offer to do developmental screenings for all its children.

In the late '70s as director of a private school for students with severe disabilities in Brewer, Maine, she made it her mission to close her school and others like it so that these children could learn in a public school setting, alongside same-age peers.

Zeph wasn't just fighting for mainstreaming, she was fighting for the rights of children with the most complex needs, including those with multiple physical and cognitive disabilities.

Her position was often unpopular among parents, teachers and administrators. But she pushed on, because she is an innovator. And, when she needs to be, an instigator.

"People thought what I was proposing was impossible, but I became committed

"For the kids that we're talking about, this community, just because they don't learn the same way other kids do doesn't mean there have to be limitations to their learning."

Lu Zeph

to the idea that what is now called 'inclusive education' was the best way of educating all children," Zeph says. "All of the kids learn something. They see the

struggle of a kid who can't walk or talk, or a kid who can barely pick up a pencil and they become more respectful, they find something nice inside themselves. What I learned is that we're all better for it."

IN 1975, Congress passed the Education for All Handicapped Children Act. The regulations governing that law, which were enacted in 1977, called for the right to a free, appropriate public education in the least restrictive environment. Schools suddenly had a need for teachers who were trained to work with this population.

When UMaine special education faculty set out to meet that need with a graduate program, they knew just whom to call — the woman who had made headlines for closing down schools and dreaming of something better.

"It's a great challenge to figure out how to teach (these children), and that's what got me," Zeph says. "I hoped to teach teachers how to problem solve, how to be creative, to instill the quest for figuring it out, doing what other people didn't think was possible."

She and her small cadre of students were trailblazers, and they knew the future of how these children were educated in Maine hinged on their dedication.

"One of the things Lu always emphasized was that it wasn't just being a

1972 *PARC v. Commonwealth of Pennsylvania*, a class-action suit brought by parents of children with intellectual disabilities challenging the exclusion of their children from public schools. This case affirmed both the right to education for these students and the right to education in the least restrictive educational environment.

1972 *Mills v. Board of Education*, U.S. District Court decision that the District of Columbia could not exclude students with disabilities.

1973 Passage of the Rehabilitation Act of 1973 prohibiting discrimination in federal programs and services, and all programs receiving federal funds. Section 504 specifically prohibited discrimination on the basis of handicap from

participation in any program or activity receiving federal assistance.

1974 American Association for the Education of the Severely and Profoundly Handicapped was incorporated. This organization, later renamed The Association for the Severely Handicapped (TASH) was the first national association committed to making a difference in the lives of individuals with the most

complex disabilities. TASH led the educational community through the phases of access to public schools, integration into schools and classrooms, and, ultimately, the full inclusion of students with disabilities into neighborhood schools and classrooms with their same-age peers.

1975 Passage of the Education for All Handicapped Children Act (EHA), a federal



“What these kids mostly needed was what other children already had — the opportunity to learn.” Lu Zeph

teacher and passing on skills,” says one of those early graduate students, James Artesani, who is now an associate professor of special education at UMaine. “It was looking at people more holistically to find out where these things fit in with a student’s overall quality of life.”

As these students graduated, most became teachers in these schools. Today, many of them are considered leaders in the field in Maine and beyond.

“I think in many ways, it allowed Maine to really be at the forefront of the education of this population of children,” Zeph says. “What was then highly

unusual — to educate children with very complicated needs in a general education setting along with same-age peers — created a standard. Now it’s the norm.”

ZEPH LEARNED early on that the best way to improve the quality of life for one student is to improve it for every student, systemically. That became the focus of her doctoral study in educational leadership and policy at Vanderbilt University, where she got her degree in 1983. Since then, she has been actively shaping public policy at the state and national levels.

In 1992, she became the founding

director of the Center for Community Inclusion and Disability Studies at UMaine. One of 67 University Centers for Excellence in Developmental Disabilities Education nationwide, it is a resource for professionals, researchers, advocates and individuals with disabilities and their families throughout Maine. It focuses on interdisciplinary education, research and public policy analysis, community outreach, and the creation and dissemination of resources and publications.

Though the educational climate has improved significantly for students with disabilities since Zeph entered the field, there is still work to be done. Today, the challenge is less about placing students with disabilities in public schools and more about providing learning opportunities that result in enhancing their quality of life.

“What I’ve learned over the years is try not to place limitations on what’s possible,” Zeph says. “For the kids that we’re talking about, this community, just because they don’t learn the same way other kids do doesn’t mean there have to be limitations to their learning. The challenge to us — and I think what the excitement is — is how do we figure this out? Their differences create more of a challenge for us to figure out how to help them achieve all that they can achieve.” ■

law that established the right to a free, appropriate, public education for all children, regardless of the severity of their disabilities, in the least restrictive environment. This law was later renamed the Individuals with Disabilities Education Act (IDEA).

1977 Establishment of federal funding priorities to create a competitive grant program to fund colleges and universities

to prepare special educators to teach students with severe disabilities.

1977 EHA and Section 504 regulations issued.

1979 University of Maine College of Education awarded federal funding and establishes graduate study for education specialists in severe disabilities.

1981 Maine Department of Education develops certification requirements for teachers of students with severe disabilities.

1990 Passage of the Americans with Disabilities Act (ADA).

1994 *Holland v. Sacramento City Unified School District* affirms the right of children with disabilities to attend public

school classes with nondisabled peers.

1997 IDEA amendments require that students with disabilities have access to the general education curriculum.

2008 Amendments to the Higher Education Act establish opportunities for access to higher education and federal financial aid to students with intellectual disabilities.

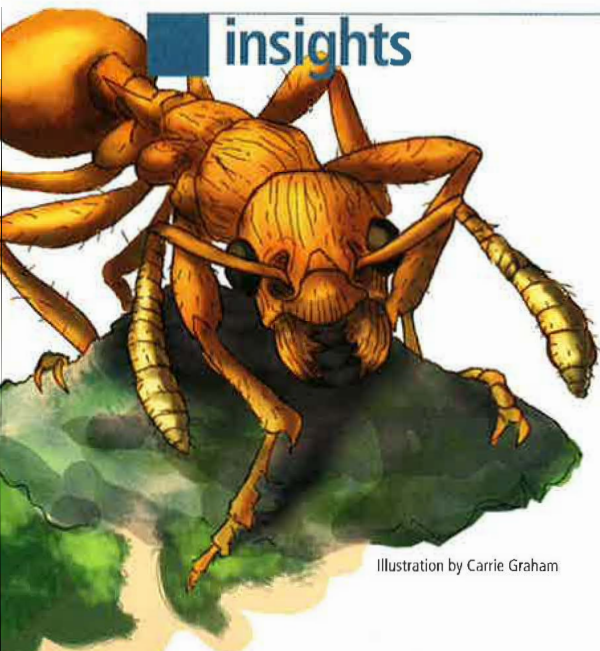


Illustration by Carrie Graham

Ant Blitz in Acadia

A UNIVERSITY OF MAINE biological diversity study, dubbed "Ant Blitz," profiled ant diversity and distribution in Maine's Acadia National Park in an effort to understand the impact of the exotic species of stinging red ants, *Myrmica rubra*, on native ants. The researchers, led by UMaine entomologists Eleanor Groden and Frank Drummond, found *M. rubra* does not dominate the entire island, but where it has invaded, few competing native species remain. The latest journal article on the study, with lead author Gary Ouellette of Sonoma State University, was recently published in *Environmental Entomology*. Among the other findings:

42 ant species live in 12 habitat types in the park. Favorite microhabitats? Logs and rocks.

7 species are most prevalent — *Lasius alienus*, *Formica subsericea*, *Myrmica detritinodis*, *Camponotus herculeanus*, *Formica argentea*, *Formica aserva* and *Tapinoma sessile*.

2 new ant species for Maine were found — *Amblyopone pallipes* and *Dolichoderus mariae*.

Horse health

UNIVERSITY OF MAINE researchers will soon begin field testing diagnostic kits designed to detect the bacteria *Streptococcus equi*, the cause of equine strangles, within hours as opposed to days for current diagnosis confirmation.

Key reagents for the field test kits were developed by Maine Biotechnology Services in Portland, Maine. The kits, marketed by New Horizons Diagnostics Corp., represent a revolutionary advancement in combating the contagious and sometimes fatal disease, according to veterinarian Robert Causey, a UMaine associate professor of animal and veterinary sciences.

"There is no doubt that the market for this is potentially global," Causey says. "No one has ever tried to do this before. This puts Maine on the cutting edge of strangles research."

A nearly \$500,000 Maine Technology Asset Fund grant awarded last fall in collaboration with researchers at the University of Kentucky and Tufts University supports the large-scale field testing and renovations at the UMaine J.F. Witter Teaching and Research Center. The facility will be used as a testing and training faculty for Maine veterinarians and students from UMaine and Tufts.

If successful, the project may lead to a statewide strangles surveillance program to increase protection of Maine's 35,000 horses.



FoodCorps in Maine

FOODCORPS, a new national AmeriCorps school garden and farm-to-school service program, has selected University of Maine Cooperative Extension as one of 10 partners to collaborate on a national launch in 2011. FoodCorps will focus on vulnerable children, improving access to healthy, affordable food while training young leaders for careers in food and agriculture.

The FoodCorps partners were chosen from 108 host site proposals submitted from 39 states and the District of Columbia.

FoodCorps will put 82 members on the ground in 10 states to work 139,400 hours during the 2011–12 school year. Like the AmeriCorps public service model, FoodCorps leverages federal funds to place young adults in high-need communities, with the mission of improving children's education about healthy food.

FoodCorps service members will build and tend school gardens, conduct nutrition education and increase the quality of the food served in the lunchroom. FoodCorps also aims to grow the next generation of farmers and food systems professionals through hands-on experience.

"Getting kids connected with local food sources and involved in gardening projects leads to having them involved in food preparation and cooking projects. As a result, they often learn to broaden their food horizons and make better food choices," says Ellen Libby, UMaine assistant Extension educator specializing in youth development.



Farm-to-school programs and school garden projects are sprouting throughout Maine's 16 counties. Those programs will continue to grow and blossom thanks to FoodCorps and the service members who will enhance current efforts." Ellen Libby, UMaine Assistant Extension Educator

Ice time

TIMING IS everything — especially when it comes to unlocking data found in ice cores used in climate change research.

That's why Bess Koffman, a Ph.D. student in Earth sciences and a University of Maine Climate Change Institute researcher, has helped develop a laboratory-based ice core melting system to provide more exact, time-precise measurements than ever before.

The device, developed primarily by UMaine Ph.D. physics student Daniel Breton and Koffman, builds on work of alumnus Erich Osterberg. It is the latest UMaine innovation that is changing the way scientists worldwide evaluate and correlate climate change data.

The device tracks the time spans captured in the ice core down to the millimeter as the meltwater passes through a particle counter and conductivity meter. The dating of events can then be tied to other climate change records with greater accuracy.



Commitment to water quality

THREE YEARS ago, members of the University of Maine student chapter of Engineers Without Borders traveled to the small Honduras town of Dulce Vivir to oversee installation of a drainage system they designed to prevent flooding. This spring, EWB-UMaine members are planning to return to Dulce Vivir, this time to begin construction of a new UMaine-designed septic system.

The system will replace the cesspits that currently discharge sewage into backyards due to low soil permeability and a high groundwater table. The homes in Dulce Vivir do not have indoor plumbing, but rather a pour-flush latrine behind each house that empties into a covered cesspit.

The new septic system, designed by UMaine students and mentors from Maine and Honduras, will pipe waste from the latrines into a communal septic system consisting of a series of tanks and a raised leach field. Community members will receive training on how to maintain the system; EWB-UMaine will provide continued technical support for at least five years.

Oldest domesticated dog in Americas discovered

EVIDENCE OF THE OLDEST identifiable domestic dog in the Americas was recently discovered by Samuel Belknap III, a University of Maine graduate research assistant working under the direction of Kristin Sobolik in UMaine's Department of Anthropology and the Climate Change Institute. Belknap found the 9,400-year-old skull fragment of a domestic dog during analysis of an intact human paleofecal sample.

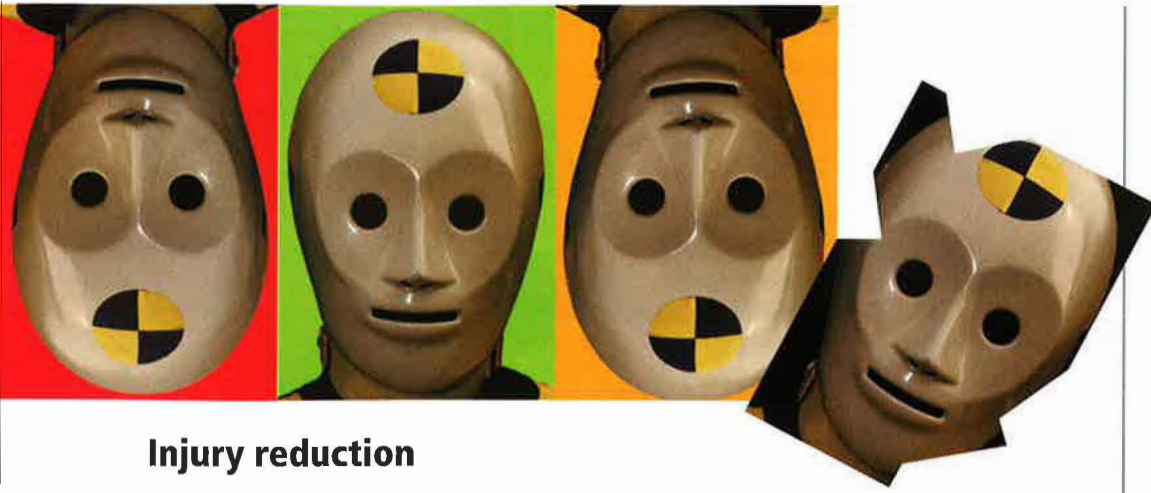
The fact that the bone was found in human waste provides the earliest proof that humans in the New World used domesticated dogs as food sources.

"This is an important scientific discovery that can tell us not only a lot about the genetic history of dogs, but of the interactions between humans and dogs in the past," says Belknap. "Not only were they most likely companions as they are today, they served as protection, hunting assistants and also as a food source."

Belknap's discovery will be documented in the *American Journal of Physical Anthropology*, as well as other scientific journals.

Belknap discovered the bone during the 2009–10 academic year while examining a paleofecal sample recovered in the 1970s from Hinds Cave, a major archeological site in southwest Texas. He was conducting his thesis research on ancient diet and nutrition of humans in the Holocene Era in the Lower Pecos Region of Texas.

The age of the bone and fecal material was confirmed using accelerated mass spectrometry radio-carbon dating.



Injury reduction

A NEW BIOMECHANICAL laboratory at the University of Maine will help test and evaluate injury-reduction, repair and rehabilitation equipment under development by several small Maine companies.

The lab will employ a family of state-of-the-art crash test dummies on which to perform impact and vibration tests to determine, for example, which new protective materials work best in reducing head trauma — from injuries incurred in falling to soldiers' head wounds and complications due to vibration during air evacuation. Another objective is the design, development and commercialization of an assistive robotic exoskeletal rowing machine for people with disabilities.

The Biomechanics Laboratory for Injury Reduction and Rehabilitation in UMaine's Advanced Manufacturing Center will be established in the next year with a \$533,000 grant from the Maine Technology Asset Fund. The research is a part of the university's commitment to help small companies with good ideas but limited access to testing facilities develop products and verify that they are ready for commercialization, says principal investigator Vincent Caccese, a professor of mechanical engineering and expert in structural mechanics.

Click, crack, eat

THE SECRETS to getting the most out of your next lobster dinner are just a click away with iLobster. University of Maine alumnus and Colby College web programmer Ben Greeley developed the new app, illustrated and designed by Colby graphic designer Robert P. Hernandez, to provide step-by-step instructions on how to cook and efficiently crack into a crustacean. The app for the iPhone, iPod Touch and iPad also can locate lobster restaurants in your area and put you in touch with

Maine companies that ship crustaceans. A future release will connect you to resources like the Lobster Institute at the University of Maine.



Undergrad researchers

AS A RESULT of their experiences in research and creative activities, undergraduates make large gains in their understanding of how knowledge is constructed, and they learn how to tolerate obstacles and analyze data, according to a new student survey. The survey of 101 University of Maine undergrads involved in research or creative activities between June 2008 and May 2009, conducted by UMaine's Center for Undergraduate Research, also found:

44

students
were
doing
research
for the
first time

81

students
were
involved in
independent
or directed
study, and
class or lab
experiences

75

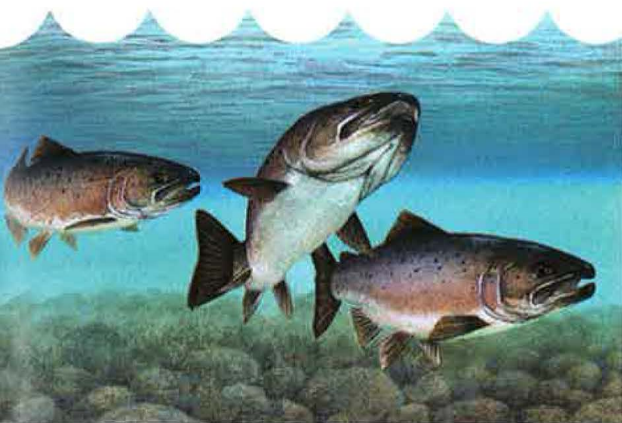
students
found out
about the
research
from a
faculty
member

88

students
said they
would tell
their friends
to consider
doing
research

89

students
said they
would
engage in
research
again if
given an
opportunity



“

Because it's such a high level of containment, we'll be able to work with pathogens that are not only exotic to Maine, but exotic to the U.S. as well, with no risk of them escaping into the wild.”

Ian Bricknell, Director of UMaine's Aquaculture Research Institute

Aiding aquatic health

A NEW HIGH-LEVEL containment facility for cold-water aquaculture research at the University of Maine will be the only laboratory of its kind in the U.S. and one of few worldwide.

FISHLab, being built to Bio-Safety Level-III specifications, will be open to university researchers and private industry. It will more than double the amount of high-level containment space UMaine has for conducting experiments on pathogens of aquatic animals.

The new facility could lead to more U.S.-approved vaccines to treat diseases in fish, frogs, lobsters, sea urchins and dozens of other species.

Construction of FISHLab is expected to start this spring adjacent to the Aquaculture Research Center on campus. It is funded by a recent \$600,000 grant from the Maine Technology Asset Fund. Support for the grant came from international pharmaceutical giant Novartis and Richmond, Maine-based Micro Technologies, which use the Maine Aquatic Animal Health Laboratory on campus.



A Member of the University of Maine System

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Rural women key to Ethiopia conservation

WITH INCREASED educational opportunities and active participation in policymaking, rural women in Ethiopia could hold the key to reversing years of tension and establishing positive outcomes for wildlife conservation and protected areas in their country, according to four international researchers.

To better understand the factors influencing a positive community attitude toward wildlife and protected areas, the researchers — Mekbeb Tessema, Zelealem Ashenafi and Nigel Leader-Williams of the University of Kent and Robert Lilieholm of the University of Maine — examined Ethiopia's conservation strategies and collaborative management practices. Ethiopia is one of only two African countries lacking colonial-era natural resource policies.

Their survey results, published in the journal *Society & Natural Resources*, found that establishing benefit-sharing programs to help reduce the burden on a community from the loss of usable land and resources fostered positive views on conservation areas. The results also showed that food security, shared tourism revenue, job creation and establishment of public works are among the most pressing local concerns.



Photo by Robert Lilieholm

Many scholarships, research opportunities and academic offerings for UMaine students are made possible by donations to THE FUND. Annual gifts give UMaine the flexibility to address its most pressing needs and to take advantage of new opportunities. Please consider a gift today. Contact the Office of University Development, 207-581-1161/800-671-7085 (umaine.edu/give).

THE FUND
FOR THE UNIVERSITY OF MAINE

A perfect opportunity to Rollover — our IRA!

The IRA Charitable Rollover Extension is available through Dec. 31, 2011. We encourage you to consult with your financial advisor about this law. For your gift to UMaine through the University of Maine Foundation to qualify for benefits under the extension:

- You must be 70½ or older at the time of your gift
- The transfer must go directly from your IRA to the University of Maine Foundation
- Your total IRA gift(s) cannot exceed \$100,000 per year
- Your gift must be outright

For more information, contact Sarah McPartland-Good, director of planned giving; Daniel Willett or Daniel Williams, planned giving officers.

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"We have been discussing ways to enhance the two scholarships at UMaine that are in our names. We found the perfect opportunity to benefit our funds by diverting some of our IRA required minimum distributions for 2011 to the University of Maine Foundation. By doing so, we are able to increase the value of our funds while taking advantage of the tax break that the extension of the IRA Charitable Rollover benefit offers."

Wallace C. Dunham, Dean, Director,
Professor Emeritus

Janet S. Dunham, '77 M.Ed

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